Space Weather Forecast

Issued on Friday, 16 June 2023 at 01:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of Moderate solar activity with R1/R2 Radio Blackouts. Chance of G1/Minor geomagnetic storm conditions early today.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low. There are currently eight numbered sunspot regions on the visible disc, and one new small and weak region in the northwest quadrant. The largest region is AR3333, which is moderately sized and a moderately magnetically complex. However, the largest flare during the period was large Common class flare at 15/1255 UTC from AR3335. This region is slightly smaller and magnetically slightly simpler region, but it is close to AR3336. The magnetic complexity of the combination of these two regions may have lead to the large Common class flare. Remaining regions are small, weak and simple. There are also a number of large filaments, which are arcs of material held together by the Sun's magnetic field, on the Earth-facing disc. These have the potential to produce Earth-directed CMEs (Coronal Mass Injections) if they were to erupt.

Solar Wind / Geomagnetic Activity: During the first 12 hours the solar wind was at background levels, then increased to reach Strong levels, peaking at 726 km/s at 15/2142 UTC. The solar wind ended the day at strong levels around 610 km/s. Other changes in the solar wind parameters also confirmed the onset of a high speed stream associated with a large equatorial coronal hole. The strength of the solar winds magnetic field was initially Weak, but increased to reach Strong levels from early afternoon. The important north-south component was weakly negative until early afternoon, and then fluctuated between strong south and north. Geomagnetic activity was Quiet during the morning, then steadily increased to become Active to G1/Minor Storm.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is most likely to continue, however there is a chance of this increasing to Moderate with isolated M-flares (R1/R2 Radio Blackouts), especially as new regions are likely to rotate onto the visible disc later in the period.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs currently expected. Solar winds will start at Strong levels, under the continued strong solar wind enhancement. Winds will gradually decrease to Elevated to Strong levels tomorrow (17th), then to slightly elevated or elevated levels for days 3 and 4 (18th and 19th), as further coronal hole influence is likely. Geomagnetic activity is forecast to be Minor to Moderate Storm at first, decreasing to Unsettled to Active later today, but with a chance of isolated Minor storm intervals during the coming night. Geomagnetic activity is expected to further decline, becoming Quiet to Unsettled.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	80	30	5	1
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	3	3	3	3
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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